
Rhodamnia longisepala (Myrtaceae): An Endangered Species from Northeastern Queensland, Australia

Neil Snow

Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, U.S.A. nsnow@bentley.unco.edu

A. J. Ford

Tropical Forest Research Centre, CSIRO Sustainable Ecosystems, PO Box 780, Atherton, QLD 4883, Australia

B. Koblitz

Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, U.S.A.

ABSTRACT. *Rhodamnia longisepala* N. Snow & A. J. Ford is described from the Windsor Tableland region of northeastern Queensland, Australia. All known collections occur in the Chowchilla Logging Area of State Forest Reserve 144. Since only nine plants are known over an area of 1 km², the species is considered highly vulnerable. The new species is distinguished from others in *Rhodamnia* by the persistent and erect subulate sepal lobes of the fruit. The fruit droops at maturity, is covered by densely villous to hirsute hairs, and lacks a reddish stage en route to its purplish black mature color. Domatia are present on the abaxial leaf surface where the major lateral nerves join the midnerve near the petiole. *Rhodamnia longisepala* somewhat resembles *R. rubescens* in leaf morphology and pubescence, but the latter species is far more common and is distributed from southeastern Queensland to southeastern New South Wales.

Key words: Australia, domatia, endangered, essential oils, Myrtaceae, Queensland, *Rhodamnia*.

The genus *Rhodamnia* Jack consists of about 30 shrubby to arborescent species and ranges from southeastern Asia to Australia and New Caledonia (Scott, 1979; Guymer & Jessup, 1986; Guymer, 1988; Snow, 2000). Snow and Guymer (1999) recently described a rare new species, *R. angustifolia*, from southeastern Queensland.

Separate revisions of the Australian and Malesian species are currently in progress by the first author, and will include additional new species from Queensland and New Guinea. After initiating the revision of the Australian species it was soon evident from three undetermined specimens that an

undescribed species occurred in the Windsor Tableland region of northeastern Queensland. The second author recently made detailed observations of the species in its natural habitat and secured additional collections. In light of its rarity and immediate conservation concern, we are expediting publication of this species prior to the complete revisions of other Australian and Malesian *Rhodamnia*.

Herbarium specimens and living material in the field were measured using a character format similar to Snow and Guymer (1999). Descriptive terminology of shapes follows the Systematics Association Committee (1962), whereas terminology of pubescence follows Stearn (1992). We are citing all known specimens given its rarity and cogent need to document its distribution for more detailed conservation assessments (Snow & Keating, 1999).

Rhodamnia longisepala N. Snow & A. J. Ford, sp. nov. TYPE: Australia. Queensland: Cook District, State Forest Reserve 144, Chowchilla Logging Area, 500 m along old westerly logging track, 16°17'S, 145°05'E, 840 m, 26 July 2000, A. Ford 2392 (holotype, BRI; isotypes, CANB, GREE [+ photo of fruiting branch], K, L, MEL, MO, NSW, QRS [+ spirit], SYD). Figure 1.

Rhodamnia rubescens affinis sed lobis sepalis persistentibus erectisque quum fructificantibus, et fructibus pilis densis differt.

Single- to multi-stemmed large shrubs or trees, 2.5–5 m tall, spreading to erect. Bark of main trunk stringy, ± flakey, somewhat fissured, deep reddish brown. Branches of current year's growth rounded,

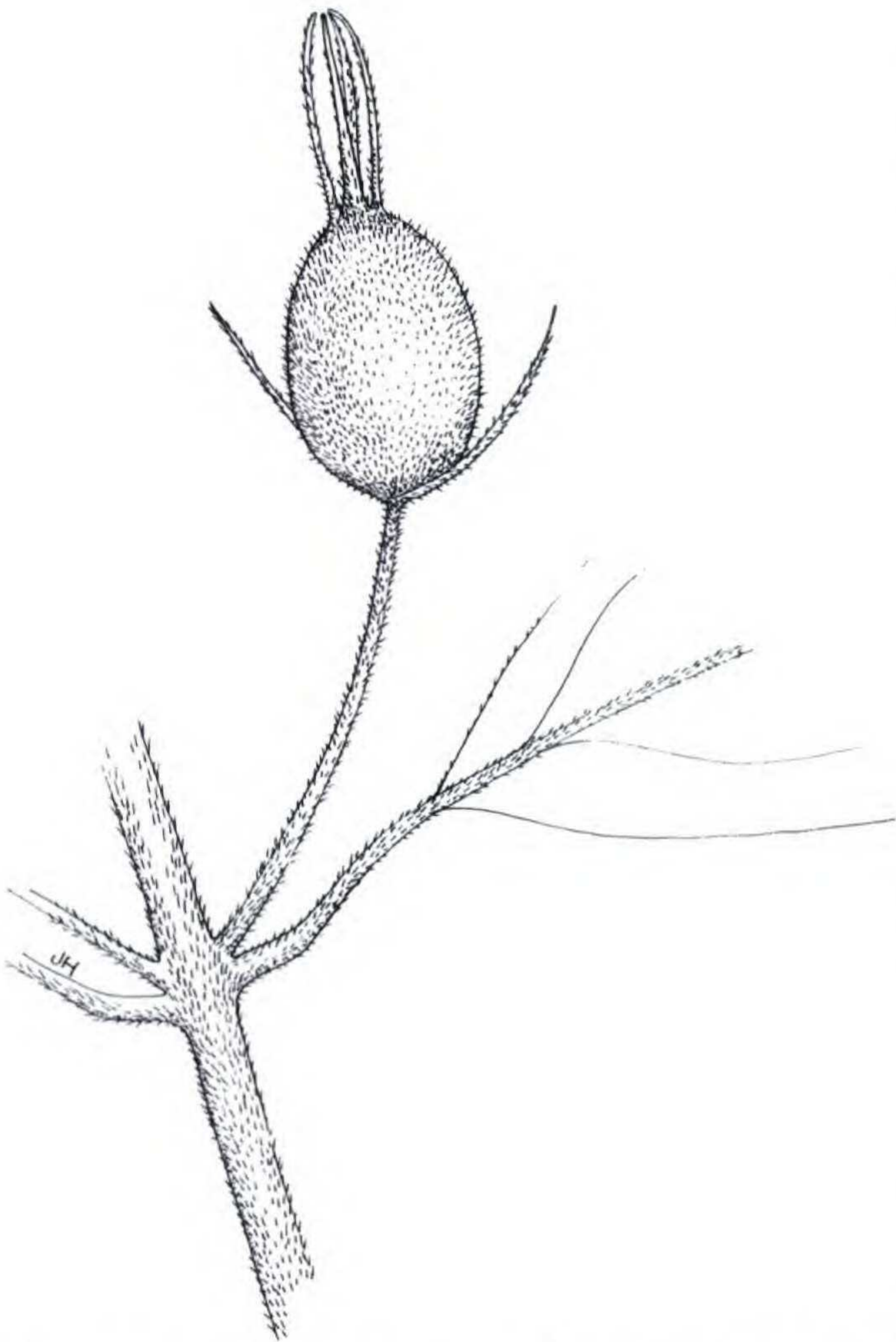


Figure 1. *Rhodamnia longisepala* N. Snow & A. J. Ford. Maturing fruit showing subulate sepal lobes and long bracteoles (from the type, A. Ford 2392). Excluding sepal lobes, the fruit is slightly less than 1 cm long. Although shown upright, the fruit is typically deflexed on the branches.

not winged, tomentose or hirsute, greenish to brownish, bark smooth, eglandular. Stipules of two to several ferruginous setose hairs, often obscured by other pubescence. Petioles 3–7 mm long, often channeled above somewhat toward apex (less so basally), eglandular. Leaves opposite, decussate, not clasping, discolorous, matte above and below, velvety, triplinerved (perfect or imperfect suprabasal acrodromous [Hickey, 1973]), elliptic to ovate, 35–86 × 20–42 mm, base cuneate to rounded, apex acute to acuminate, ultimate tip (if present) mucronate, margins flat; adaxial surface somewhat sparsely to moderately villous to hispid, the hairs mostly arising directly from veins (of all orders) and often red at base, oil glands visible with magnification, common to dense with 1 to 4 glands per areole (Hickey, 1973), midvein impressed; abaxial surface villous to hispid, densely so on midvein, decreasingly so on increasing orders of venation, veins all prominently raised, 3.5–6.2 mm from margin at midpoint, secondary veins indistinct below but prominent in upper half, intramarginal vein ab-

sent or at best poorly formed, irregular and looping, 1.0–1.8 mm from margin at midpoint, gland density as for adaxial surface. Inflorescence of monads in leaf axils, anthopodia and metaxyphylls absent (Briggs & Johnson, 1979), peduncles rigid, 8–12 mm long, densely villous to hirsute. Bracteoles two, linear, not foliaceous, 5–7 × 0.3–0.4 mm, irregularly flexuous or incurved above, apex exceeding base of sepal lobes, villous to hirsute, sometimes persistent in fruit. Hypanthium urceolate, 2.7–3.2 mm long, oil glands common (but often faint), densely villous to hirsute. Sepals 4, often with stipule-like glands on either side of base, distinct in bud, greenish, lobes 4.5–6.5 mm long, linear to narrowly triangular, apex acute, villous to hirsute, persistent and erect (and more so in fruit). Petals 4, alternate with sepals, white (drying very light orange-brown), 4.5–5.5 × 3.0–3.7 mm, ovate to widely ovate, adaxial surface glabrous with some marginal hairs at apex, abaxial surface glabrous with some marginal hairs toward apex, oil glands sparse to common. Stamens 40 to 50, multiseriate, included, folded toward center in bud; filaments 2.6–3.8 mm long, staminal disk glabrous, ovary apex shortly hairy; anthers subglobose to globose, basifixed, 0.5–0.6 mm long, dehiscing via longitudinal slits, apical gland present. Ovary 1-locular, placentas 2, parietal, ovules 2 or 3 per placenta. Style 4.8–5.2 mm long, straight or curved toward apex, glabrous, stigma terete. Fruit a berry, ellipsoid, rounded at base, 8.5–10 mm long, 5.5–7 mm diam., densely villous to hirsute, maroon to purplish black at maturity. Seeds 2, globular to reniform, 3.5–3.8 mm long, one surface somewhat convex, the other somewhat concave, testa hard, light brown, operculum present. Embryos apparently aborting or highly shriveled.

Flowering occurs from June through August; fruiting occurs from July through September. The elevational range is 840–950 m.

Rhodamnia longisepala is presently known in dry rainforest, Type 6, complex notophyll vineforest (Tracey, 1982) on granitic substrates. Canopy dominants include *Agathis robusta* (C. Moore ex F. Mueller) F. M. Bailey, *Aleurites moluccana* (L.) Willdenow, and *Argyrodendron polyandrum* L. S. Smith. Common small trees include *Dinosperma melanophloia* (C. T. White) T. G. Hartley, *Canthium lamprophyllum* F. Mueller, *Croton insularis* Baillon, *Austromyrtus bidwillii* (Benth) Burret, *Pouteria myrsinoides* (A. Cunningham ex Benth) Baehni, *Elattostachys microcarpa* S. T. Reynolds, *Rhodamnia costata* A. J. Scott, *Acronychia laevis* J. R. Forster & G. Forster, *A. imperforata* F. Mueller, and

Diospyros pentamera (Woolfs & F. Mueller) F. Mueller. Type 6 forests can be found on basalt, granite, rhyolite, and metamorphics. In northeastern Queensland, this type of rainforest is characterized by the high representation and proportion of southern elements more akin to the rainforests of southeastern Queensland and northeastern New South Wales. The exceptionally dry phase of the dry season appears to be the common denominator ecologically between the Type 6 rainforests in northeastern Queensland and those in southeast Queensland and northern New South Wales. The dry Type 6 forests in northeastern Queensland harbor few local endemics such as *Elaeocarpus coorangooloo* J. F. Bailey & C. T. White, despite their relatively wide distribution in the northeast from the Cooktown region south to the Kirrama area (Tracey, 1982). This is in marked contrast to the wetter rainforests of northeastern Queensland, which are home to numerous local endemics.

Neither the crushed leaves nor the flowers of *Rhodamnia longisepala* emit a particularly distinct aroma (A. Ford, pers. obs. 2000), although some species such as *R. australis* A. J. Scott have strongly scented flowers. Small domatia occur at the junction of the midnerve and primary lateral nerves on the abaxial leaf surface. One specimen (Ford 1953) has several small, undetermined golden brown mites or insects about 0.4 mm long preserved in the pubescence at the entry to the domatia.

Rhodamnia longisepala shows considerable variation in its growth form and vigor. Although speculative on our part, this may reflect the disturbance history of the site, particularly that due to logging activities. In places where disturbance from logging has ceased for adequate time to allow the canopy to grow back to its approximate undisturbed density, plants of *R. longisepala* had a single stem that had decayed over time, but which had coppiced (often profusely so). The stems of such plants are lanky and often leaning. In contrast, plants in more recently disturbed sites with a broken canopy are single-stemmed, erect, with considerable branching, and lack coppicing. Growth of *R. longisepala* thus may be stimulated by mild disturbances, particularly those that increase the total amount of light.

From existing herbarium specimens it appears that *R. longisepala* was first collected in 1990 by Gary and Nada Sankowsky (GS+ 1110). This and subsequent collections at BRI were erroneously placed under *R. rubescens* (Benth.) Miq., even though good flowering material was present. It is surprising that *R. longisepala* was never apparently collected by employees of the former Atherton For-

estry Office in the vicinity of the currently known population, given their frequent collecting in that general area. It appears that all collections of *Forster* and *Sankowsky* (see below) came from a single plant, given recent personal communications with these collectors.

Rhodamnia longisepala most closely resembles *R. rubescens* but differs from the latter species by its persistent subulate sepal lobes, which remain erect in fruit and are much longer than those of *R. rubescens*, the 4- to 6-ovuled ovary, the lack of a reddish stage during the maturation of fruit (although it can become brownish when dried), and the dense covering of villous hairs on the mature fruit (Table 1). *Rhodamnia longisepala* superficially resembles *R. pauciovulata* Guymer (1988), which has shorter leaves, shorter calyx lobes and petals, and glabrous fruits. The dull, lime-colored leaves with their villous to hirsute pubescence should help distinguish *R. longisepala* from closely related species. The current geographical ranges of *R. rubescens* and *R. pauciovulata* are disjunct from *R. longisepala*, making it further unlikely they will be confused. *Rhodamnia longisepala* was not known during preparation of the interactive key to Australian Tropical Rain Forest Trees and Shrubs (Hyland et al., 1999). A complete key to the Australian and Malesian species of *Rhodamnia*, including additional new species from Queensland and New Guinea, is in preparation.

Rhodamnia longisepala is the second rare species of the genus recently described from Queensland (Snow & Guymer, 1999). Currently, *R. longisepala* is only known from nine specimens over an area of approximately 1 km² on the Windsor Tableland of northeastern Queensland, in the Chowchilla Logging Area of State Forest Reserve 144. As such, it is presently even more rare than the 19 known individuals of *R. angustifolia* N. Snow & Guymer (Snow & Guymer, 1999), and must be considered Endangered by both the IUCN Species Survival Commission (1994) and the Queensland Nature Conservation Act of 1992. Additional fieldwork to better document its range and relative abundance should be a high priority in the near future.

Essential oil profiles have been assayed for Australian *Rhodamnia* (Brophy et al., 1997). One collection (*Forster PIF 13699*) now recognized as *R. longisepala* was incorrectly determined (Brophy et al., 1997) as *R. rubescens*. Brophy (pers. comm., 2000) indicates that the sample of *R. longisepala* is qualitatively similar to two collections of *R. rubescens* in its leaf oil profiles. The main components of *R. longisepala* are α -pinene (40–51% of volatile oils); β -caryophyllene (10–13%), and globulol and

Table 1. Vegetative and floral differences among *Rhodamnia longisepala*, *R. pauciovulata*, and *R. rubescens*. Dimensional measurements for *R. longisepala* are tentative due to limited fertile material. Some data obtained from Guymer (1988).

	<i>R. longisepala</i>	<i>R. pauciovulata</i>	<i>R. rubescens</i>
Leaf pubescence, adaxial	moderately villous to hispid	tomentose with longer hairs interspersed	tomentose to villous
Domatia on leaves	present at junction of abaxial lateral nerves and mid-nerve	absent	absent
Inflorescence type	monad	monad	monad, triad, botryoid
Hypanthium length mm (to base of sepal lobes)	2.7–3.2	1.0–1.5	1.8–2.6
Sepal lobe length in flower (mm)	4.5–6.5	1.5–2.0	2.0–2.3
Sepal lobe persistence in fruit	persistent	persistent	deciduous
Petal length (mm)	4.5–5.5	3.0–3.6	4.0–4.5
Ovule number per placenta	2 or 3	4 to 6	35 to 80
Fruit length (mm)	8.5–10	4.5–5.5	5–11
Fruit width (mm)	5.5–7	5–7	10–12
Fruit indumentum	densely villous to hirsute	glabrous	sparsely sericeous
Reddish stage during fruit maturation	absent	absent	present

viridifloral (3–5%), and spathulenol (7–9%). The latter two compounds are present in much smaller amounts than in the two samples of *R. rubescens*, which has α -pinene of approximately 82%. More sampling is needed to establish whether these differences are significant.

The specific epithet *longisepala* refers to the long sepal lobes relative to all other species in the genus.

Paratypes. AUSTRALIA. **Queensland:** Cook District, Mount Windsor Tableland, State Forest Reserve 144, Aleurites area, 16°17'S, 145°05'E, 7 July 1997, A. Ford 1953 (QRS); Aleurites site, 16°17'34"S, 145°05'21"E, 10 July 1995, P. I. Forster PIF17227 & S. J. Figg (BRI, QRS); Windsor Tableland, 16°17'S, 145°03'E, 20 July 1990, G. Sankowsky 1110 & N. Sankowsky (BRI, DNA [not seen]); Chowchilla Logging Area, about 800 m into rain forest, 16°17'S, 145°05'E, 30 Aug 1998, A. Ford 2095 (BRI, QRS); 9 km past Spencer Ck. crossing, 16°18'E, 145°05'S, 24 July 1993, P. I. Forster PIF13699 *et al.* (BRI).

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